Smoking cessation and diabetes control in Kerala, India: an urgent need for health education

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Abstract

This study documented the tobacco use among male diabetes patients in a clinic-based population of urban India, patient reports of physician cessation messages and patients' perception of tobacco use as a risk factor for diabetes complications. All the 444 male diabetes patients who attended three public sector hospitals in Thiruvananthapuram district, Kerala, were surveyed to ascertain their tobacco use as well as the frequency and content of quit messages received from health staff. A significant proportion (59%) of diabetes patients were tobacco users prior to diagnosis and more than half of them continued to use tobacco, many daily, even after diagnosis. Of the 100 current smokers, 75% were asked about their tobacco use at the time of diagnosis; of those, 52% were advised to quit. However, a lack of patient awareness existed regarding the linkages of smoking and diabetes complications. Notably, 52% of patients did not associate smoking with diabetes complications. Given the magnitude of tobacco use among diabetics, there is clearly a need for more proactive cessation efforts. The times of illness diagnosis, illness flare-ups and emerging illness complications are teachable moments when patients are primed to change their behavior and more motivated to quit tobacco.

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Introduction

It has been predicted that diabetes will be one of the world's leading causes of disability and death as well as health expenditure in the coming 25 years. Globally, the number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030 [1]. Worldwide, the greatest absolute increase in the number of people with diabetes will be in India. In 2000, India had the largest number of people with diabetes, 31.7 million, which is projected to increase to 79 million by 2030 [1]. Studies from various parts of India have reported a steady increase in the prevalence of diabetes from 2% in the 1970s to >15% in the early 2000s. The highest rates of diabetes prevalence are in India's southern states [2]. The southern state of Kerala reported the highest diabetes prevalence of 16.2% [3]. Notably, diabetes affects all social strata. Although diabetes prevalence in India is highest among the upper classes [2], complications related to diabetes such as coronary heart disease, neuropathy, cataract, peripheral vascular disease, dyslipidemia and hypertension are highest among the lower social classes [4].

Diabetes is associated with several risk factors ranging from genetic susceptibility to dietary and environmental factors [5, 6].

Several prospective studies have reported that cigarette smoking is an independent and modifiable risk factor for diabetes [7–9]. Current smokers were

reported to have 2.1 times higher risk of developing diabetes compared with non-smokers in a study among a healthy population [8]. In one prospective study [10], 25% of the smokers developed diabetes at 5 years compared with 14% of never smokers.

The association between diabetes complications and smoking is well established. Cigarette smoking increases the risk of coronary heart disease, stroke and peripheral vascular disease in type 2 diabetes patients [11]. Smoking and diabetes interact to increase the risk of cardiovascular disease nearly 14 times more than either smoking or diabetes alone [12]. The interaction of these two risk factors appears to be much greater than their additive effect.

The prevalence of tobacco use in India and Kerala state is high. In India, 47% of men and 14% of women aged ≥15 years either smoke or use smokeless tobacco (chewing tobacco) [13]. In Kerala, the prevalence of current smoking among men in the age group of ≥15 years is estimated to be 36% compared with 33% in India as a whole [14]. Smoking among women is low in India (1.4%) as well as Kerala (0.1%).

Kerala has the highest health and social development indicators in India, which approximate that of developed nations [15]. Kerala spends more than other states on its health sector and the population has high rates of household medical consultation in both the public and private sectors. Nevertheless, tobacco use and tobacco-related non-communicable diseases in the state are on the rise [14, 16].

Objectives

Although tobacco use data are available on the national and regional levels, information on tobacco use among populations of people afflicted with specific diseases is limited. India has a high prevalence of both diabetes and tobacco use, yet, little research has been conducted on tobacco use among diabetes patients. Therefore, we decided to conduct this study with the following three major objectives: (i) to document the prevalence of tobacco use among male diabetes patients in a clinic-based population, (ii) to investigate whether patients remember receiving quit messages from their physicians and (iii) to investigate patients' sense of perceived risk of tobacco use as a factor associated with diabetes complications.

Methods

The study was conducted in Thiruvananthapuram district of Kerala, India. A pilot study was conducted from October 2003 to January 2005 among 200 male diabetes patients who attended the diabetes clinics of Thiruvananthapuram Medical College and two private clinics in the district that offered special clinics for diabetes patients. Given the fact that in Kerala, prevalence of smoking among women was negligible, our study focused solely on males. In the pilot study, we investigated the feasibility of a detailed study on factors associated with tobacco use among male diabetes patients before and after diagnosis of diabetes.

An interview schedule was developed based on the information from the pilot study. We examined the present and past smoking behavior of current diabetic smokers in greater detail as well as their perceptions of risk and physicians' cessation messages. Information on age, education, marital status and socioeconomic status was also collected using the schedule. Socioeconomic status was assessed by self-report. We interviewed all the 444 male diabetes patients from the diabetic clinics of three government hospitals in Thiruvananthapuram district during the period of September 2006 to June 2007 to obtain 100 current smokers in our sample. These were the main public sector hospitals that offered diabetic clinics in the district. We decided to limit our detailed study to government hospitals due to logistical reasons. Access to patient information was comparatively difficult in the private clinics. Interviews explored cultural ideas about the cause of diabetes and symptom flare-ups, use of different types of tobacco products and their perceived harm to health when used at different levels and quit experiences. We also conducted 25 open-ended in-depth interviews and collected 10 detailed case reports to explore qualitative data on patients' perception of diabetes risk factors and linkages

between tobacco use and hypertension, as well as patients' interpretation of physicians' cessation messages.

The present study is a research activity developed by Project Quit Tobacco International (QTI) [17]. The study was approved by the Institutional Ethics Committee of the Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram. Informed consent was obtained from all the patients who took part in the study.

Tobacco use was defined as follows: ever user, those who ever used any tobacco products in lifetime; current user, those who used any tobacco products during the last 30 days of interview and never user, those who never used any tobacco products in lifetime.

Results

Ever use of tobacco, use of tobacco 1 week prior to diagnosis of diabetes and current use of tobacco are given in Table I. Of the 444 patients interviewed, 22.5% (100) were current smokers. Eighty-two percent of the cigarette smokers, 77% of bidi smokers and 100% of those who smoked both cigarettes and bidis were daily smokers. Quantity of smoking among the current smokers is given in Table II. The mean number of cigarettes smoked daily was 4.3 [standard deviation (SD) = 1.4] and bidi was 4.6 (SD = 1.4). The socio-demographic characteristics of current smokers reveal that mean age was 55.8 years (SD = 11.9), 90% were literate and 44 and 56% were from the lower and middle socioeconomic strata, respectively. No one reported that they belonged to the upper socioeconomic strata. There were only small differences in mean number of cigarettes/bidi smoked per day across socioeconomic strata and different educational backgrounds.

We examined how diagnosis of diabetes affected their tobacco use. Following diagnosis, of 59.6% (265) ever users, 45% had quit completely while 55% continued using tobacco. The major reason cited for quitting was that smoking was deemed bad 'when ill' (65%) and chewing was bad when ill (50%). On a follow-up question about a possible link between tobacco use and complications related to diabetes, only 21% of the smokers who quit and 25% of the chewers who quit reported they quit because they thought smoking/chewing might aggravate their diabetes. Quitting was for general health reasons—not to prevent diabetes complications. Many quitters cited economic hardship as the reason they stopped smoking.

Of those who continued to smoke, 52% reported that smoking does not influence diabetes, 13% said that smoking mildly aggravates diabetes and only 35% reported that smoking very much aggravates diabetes. Of the eight chewers interviewed, none reported that chewing leads to diabetes exacerbation or complications. We further interrogated whether second-hand smoke was thought to have any negative effects to those with diabetes. None of the respondents perceived that second-hand smoke might pose a special threat to diabetes patients the way it would pose to someone with asthma. We also queried whether smoking was thought to influence the effectiveness of diabetic drugs. Only a small proportion thought that smoking negatively impacts the effectiveness of diabetic drugs.

Change in the quantity of smoking following diagnosis of diabetes is given in Table III. Following

Table I. *Prevalence of ever tobacco use, use 1 week prior to diagnosis of diabetes and current use during the last 30 days of interview (n = 444)**

Tobacco use	Ever use % (95% CI)	Use 1 week prior to diagnosis of diabetes % (95% CI)	Current use % (95% CI)
Exclusive smokers	43.9 (39.3, 48.5)	43.5 (38.9, 48.1)	20.5 (16.7, 24.3)
Exclusive smokeless product users	8.5 (5.9, 11.1)	8.5 (5.9, 11.1)	9.9 (7.1, 12.1)
Smoking and smokeless product users	7.2 (4.8, 9.6)	7.0 (4.6, 9.4)	2.0 (0.7, 3.5)

*Values in brackets are ranges of confidence interval (CI).

the diagnosis of diabetes, 27% of the cigarette smokers and 31% of the cigarette and bidi smokers reduced their consumption by ⩾75% and 30% of the bidi smokers reduced their consumption by 50%. Prior to the diagnosis of diabetes, the mean number of cigarette and bidi smoked daily was 14.8 and 15.0, respectively. After the diagnosis, the mean number of cigarettes and bidi smoked daily was reduced to 4.3 and 4.6, respectively. We asked current smokers about their impressions of safe levels of smoking. Among the 100 current smokers queried, 34% of the cigarette smokers and 30% of the bidi smokers reported that a level of 1–5 sticks a day is safe to use. Notably, another 34% of the cigarette smokers and 46% of the bidi smokers reported that one could use 6–25 sticks a day without much harm to health. The remaining smokers felt that all levels of smoking were harmful for health.

We further investigated whether tobacco users shifted from smoking to the use of smoke-

less products or vice versa as a form of harm reduction. Three smokers reported shifting to chewing for harm reduction, but 9 of the 100 current smokers reported shifting the brand of cigarette they smoked to a milder cigarette for harm reduction.

Of the 100 current diabetic smokers, 33% reported they suffered from hypertension. There is a strong belief among diabetes patients that diabetes and hypertension are closely related. Indeed, 'sugar and pressure' (colloquial use for diabetes and hypertension, respectively) are often described as like 'family members or twins'. During previous QTI project interviews in the general population [18], some informants spoke of smoking as a means of reducing tension (stress). In this study, we investigated whether those with diabetes felt that low-level smoking reduced tension and whether it was a form of harm reduction for hypertension. None of the 100 diabetes patients stated that they smoked either to reduce their chances of getting hypertension or to reduce hypertension if they had it. Several informants did state that while smoking did not directly reduce tension, it diverted one's attention from stressful thoughts. This in turn had an indirect effect on stress, which was thought to be a major cause for diabetes flare-up.

We also investigated whether smoking was ever used as a form of harm reduction related to weight control. Among the current smokers, only eight patients thought that smoking was a viable way to reduce hunger and/or control body weight. None of the eight tobacco chewers reported chewing as a conscious way to reduce eating.

Table II. *Quantity of smoking among current smokers during the last 30 days of interview*

Range (no. of sticks)	Cigarette smokers (n = 74)	Bidi smokers (n = 13)	Cigarette and bidi smokers (n = 13)
1–3	24 (32.4)	03 (23.1)	00 (0)
4–6	20 (27.0)	02 (15.4)	03 (23.1)
7–10	13 (17.6)	04 (30.8)	00 (0)
11–20	13 (17.6)	03 (23.1)	04 (30.8)
>20	04 (5.4)	01 (7.6)	06 (46.1)

CI, confidence interval.

Table III. *Changes in the quantity of smoking following diagnosis of diabetes*

Changes in quantity of smoking	Cigarette smokers (n = 74)	Bidi smokers (n = 13)	Cigarette and bidi smokers (n = 13)
No. of cigarettes/bidis remained the same	13 (17.6)	02 (15.4)	04 (30.8)
No. of cigarettes/bidis decreased 25%	05 (6.8)	05 (38.5)	01 (7.7)
No. of cigarettes/bidis decreased 50%	24 (32.4)	04 (30.7)	03 (23.0)
No. of cigarettes/bidis decreased ⩾75%	20 (27.0)	0	04 (30.8)
Number of cigarettes/bidis increased 25%	08 (10.8)	02 (15.4)	01 (7.7)
Number of cigarettes/bidis increased 50%	04 (5.4)	0	0

Physicians' cessation message

Physicians treating those with diabetes have a key role to play in smoking cessation. To the question did your doctor ask you about your tobacco use during the time of diagnosis of diabetes, 75% of the current smokers responded yes. Fifty-two percent of respondents received advice to quit smoking and 21% were advised to cut down smoking. During the last year, all but three patients of the 100 current smokers consulted their physicians and 57% of them consulted ≥10 times (patients who receive insulin daily). Forty-two percent of the 97 patients were not asked about current tobacco use in the past year and 22% reported that they were asked only once. The remaining 36% of patients reported they had been asked more than once. Clearly, reinforcement of cessation messages during follow-up visits was limited. Even when complications occurred, there was rarely follow-up on current tobacco use or specific cessation messages offered to patients by physicians. We asked informants if they thought their physicians had knowledge about their smoking habits. Seventy-one percent reported that their doctor knew that they use tobacco.

Interpretation of physicians' messages

Despite physicians' advice to quit smoking, many diabetes patients continued to smoke or use other forms of tobacco. We probed how physicians' messages were interpreted by those patients who reported having received a message from their physician not to smoke. We posed the open-ended question: how did you understand the message the doctor gave you? We then followed up with the question: was it general health advice or specific for diabetes patients? We learned that messages about quitting smoking did not have the intended impact for several reasons. First, the messages were often introduced at the same time information about food and alcohol consumption was being discussed. These behaviors received more emphasis. Second, most of the smoking messages were general and not specifically directed to diabetes. The messages did not tie specific symptoms or complications of diabetes to smoking/tobacco use. Common messages received were as follows: 'you can have small amount of drinks occasionally but not smoke', 'don't smoke and eat too much rice', 'don't smoke or chew since you are aged', 'it is better to quit smoking' and 'try to quit or reduce smoking as possible'.

Patients' interpretations of the meaning of these messages were often that smoking was bad for health in general, but not particularly bad for those with diabetes. For example, one informant noted 'doctor advised me ''it is bad to smoke'', but I did not understand that tobacco use and diabetes are linked. I did not understand the seriousness'. We found that when we provided specific information about the dangers of smoking that affect diabetes patients, many diabetes patients were not only surprised to learn that complications are directly related to smoking but they simply were not told so. For example, one middle aged man who was bedridden with diabetes complications noted 'had the doctor advised specifically the linkage with smoking to diabetes I would have quit and this serious condition wouldn't have happened. Why did the doctor not tell?'

Discussion

This study found that a clinic-based population of male diabetes patients in urban India have a history of high prevalence of tobacco use 1 week prior to diagnosis and more than half of prior users were current users, many daily. Notably, a significant proportion of the patients were asked about their tobacco use by physicians at the time of diagnosis and half of them received quit messages. However, a significant proportion of the current smokers reported that smoking does not influence or aggravate diabetes. Clearly, a lack of awareness exists regarding the linkages of tobacco use and diabetes and its complications.

Despite physician advice to quit tobacco use, messages often went unheeded because of their general nature and a lack of disease-specific information. Patients need more 'serious' and 'specific' advice about the dangers of smoking that provides pictorial images of exactly how smoking affects

diabetes patients, images that are understood and evocative. The lack of specificity in physicians' advice on cessation may be linked with the higher levels of current smoking (15.1%) among the health service physicians in the study district [19].

Our most important finding was that only a very few informants thought that tobacco use was related to diabetes and those who did so thought that only very high levels of tobacco use (exceeding 25 cigarettes a day) might pose a risk to diabetes. This is more significant in the context of growing evidence on enhanced risk of cardiovascular events including mortality among adult smokers with diabetes due to the interaction of smoking with diabetes [11, 20]. Given the magnitude of smoking among patients with diabetes, this underscores the importance of cessation as a public health priority. The marked augmentation of the risk of vascular events due to the interaction of smoking with diabetes and other coexistent vascular risk factors (such as high blood pressure and dyslipidemia) should be a strong motivating factor for both physicians and patients to pursue tobacco cessation with greater commitment. The times of illness diagnosis, illness flare-ups and emerging illness complications are teachable moments when patients are primed to change their behavior and motivated to quit tobacco. The patients' current disease situation creates varying levels of motivation, and the presence of even small triggers leads to a renunciation of smoking [21]. Therefore, we must not miss these opportunities to encourage them to do so. There is clearly a need for more proactive tobacco cessation efforts specifically focused on diabetes patients in India. Raising consciousness about the consequences of tobacco use for diabetics will help spread the message that tobacco users suffer from more than just cancer—the prevailing view [17]. Given the large number of diabetes patients in the country, in all social classes and the increase in tobacco use all over India [22], this antitobacco message will reach a wide cross-section of the population.

Limitations

Since the sample of patients were selected from the public sector hospitals only and are therefore likely to be poorer, those patients accessing medical care from the private sector might behave differently. However, this is unlikely to undermine the results of this study.

Conflict of interest statement

None declared.

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